



Energy Management in Massachusetts' Water & Wastewater Utilities

Energy Leaders Roundtable
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Summary

- Energy Management
- Background
- Energy-Saving Examples
- * Cash Flow Model

Energy Management Saves \$\$



Water / Wastewater Treatment in MA

- 370 public facilities
- \$150M / year

Impacts

- 1 billion kWhs
- 1 million tons (CO₂)



A Targeted Approach to Advance Municipal Energy Savings and Greenhouse Gas Reductions

The map of Massachusetts is divided into 12 regions, each with a callout box showing an aerial view of a water infrastructure project. The projects are:

- Weymouth Wastewater Treatment Facility
- Middlesex-Salem Water Supply Division
- Framingham Water Treatment Facility
- Lowell Regional Wastewater Treatment Facility
- Greater Lawrence Sewer District
- Plymouth Wastewater Treatment Station
- Barnstable Wastewater Treatment Facility
- South Water Division
- Haverhill Wastewater Treatment Facility
- New Bedford Department of Public Infrastructure
- Upper Blackstone Wastewater Pollution Control District
- Abilene Water and Sewer District

These projects are being made possible by the collaborative efforts of the following organizations:

- Executive Office of Energy & Environmental Affairs
- MassCEP
- Massachusetts Division of Energy Resources
- University of Massachusetts/Amherst
- Center for Energy Efficiency and Renewable Energy
- SPA New England
- Massachusetts Technology Collaborative
- Renewable Energy Trust
- Utility / Energy Efficiency Providers: NETA, National Grid/Reliant, Cape Light Compact, Western Massachusetts Electric, United Bay State Gas, and Berkshire Gas
- Conversion or Energy Efficiency



Commonwealth of Massachusetts
Department of Environmental Protection

Cost Saving Measures

Annual
Savings

Project
Cost

Simple
Payback
(yrs)

Initiate an energy management program

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On-going

OPERATIONAL MEASURES



OM-1 Plant water pressure reduction

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OM-2 Plant water flow reduction

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OM-3 Aeration blower speed adjustment

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OM-4 Increase avg. wet well level

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OM-1 Minimize electric heat in well houses

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OM-2 Optimize batch processing times

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OM-3 Reduce backwash rate based on the density of water; reduce length of backwash based on turbidity

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OM-4 Reduce rapid mixers from high to low speed

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Cost-Saving Measures

Annual
Savings

Project
Cost

Simple
Payback
(yrs)



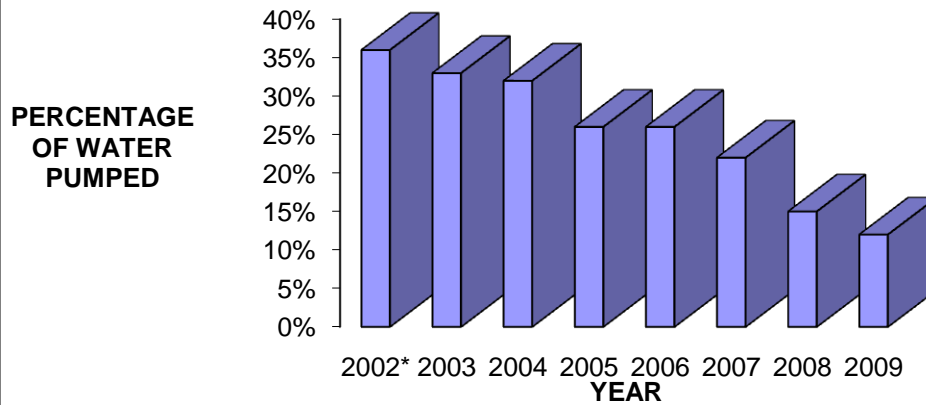
Efficiency Measures

ECM-1	Change set back temperatures (Pittsfield)	\$2,579	\$ 400	0.2
ECM-2	Minimize pump operation, change control settings (Ashland)	\$5,854	\$2,000	0.3
ECM-3	Raise water level in wet well by ½ ft.(Pittsfield)	\$ 902	\$ 500	0.6
ECM-4	Improve plant water system controls (CRPCD)	\$ 5,628	\$ 7,500	1.3
ECM-5	Install VFD on 250 hp high lift pump (Falmouth)	\$ 20,713	\$ 48,849	*2.3
ECM-6	Replace High Pressure Sodium lighting with high efficient fluorescent fixtures (Lee)	\$ 2,484	\$ 6,800	2.7

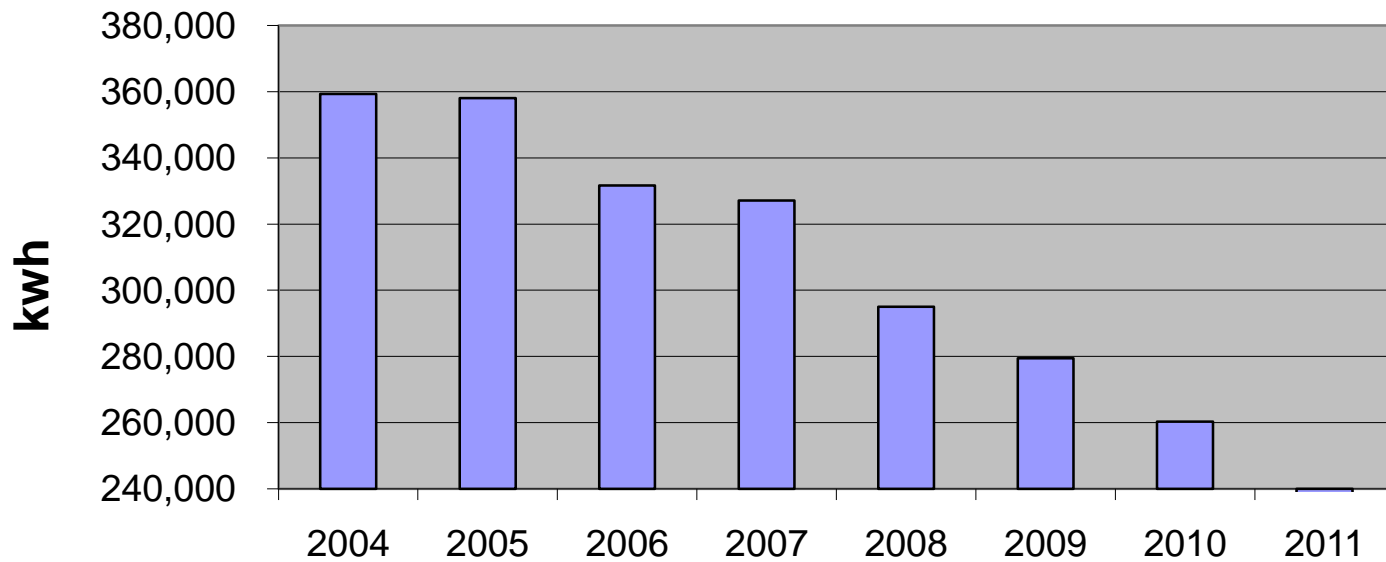


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UNACCOUNTED FOR WATER



TOTAL ELECTRICAL USE



14 Pilot Facilities



Efficiency: **Save \$2M / Year**



Green Power: **Save \$1.7M / Year**



CITY OF PITTSFIELD
WASTEWATER TREATMENT PLANT UPGRADES
FUNDED THROUGH MASSACHUSETTS DEP'S
CLEAN WATER STATE REVOLVING FUND (CWSRF) PROGRAM &
AMERICAN RECOVERY AND REINVESTMENT ACT (ARRA)

BAR RACK REPLACEMENT \$1,860,000 CONTRACTOR: R.H. WHITE AUBURN, MA	AERATION UPGRADES \$2,371,863 CONTRACTOR: C.H. NICKERSON TORRINGTON, CT
COMBINED HEAT & POWER \$1,919,000 CONTRACTOR: R H. WHITE AUBURN, MA	PHOTOVOLTAIC INSTALLATION \$7,324,682 CONTRACTOR: NEXAMP NORTH ANDOVER, MA

ENGINEER: KLEINFELDER/S E A
ROCKY HILL, CT



Energy Management Results

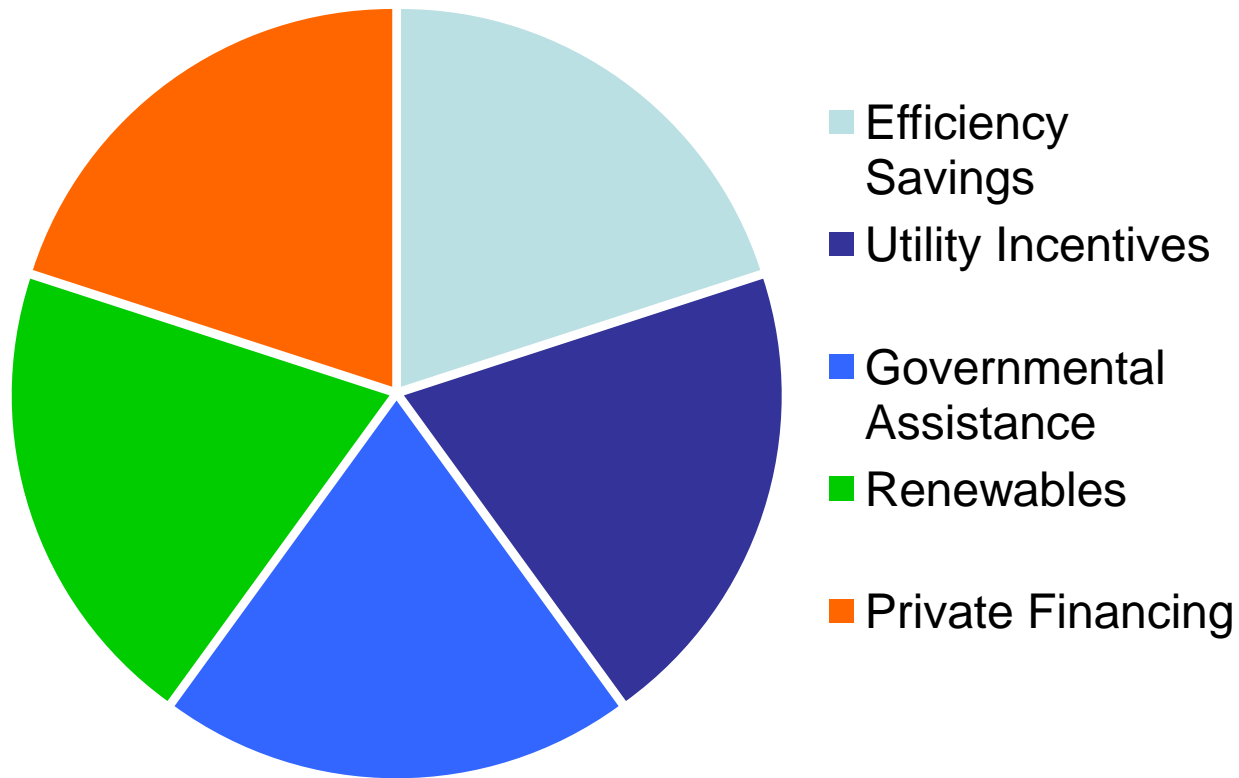
- **Wastewater**

- South Essex Sewage District
 - 31% reduction in kWh (7.8M kWh over the last 10 years)
- Edgartown
 - 20% reduction in kWh (over the last 4 years)

- **Drinking Water**

- N. Brookfield
 - 25% reduction in kWh (over the last 6 years)
 - 20% reduction in unaccounted-for water (over the last 6 years)

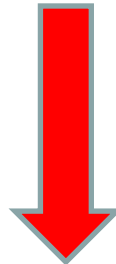
Potential Sources of \$\$



Building a “positive cash flow”

Capital cost – utility incentives

Energy savings – debt service / payments



Money in your pocket!



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Thank You!

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